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ABSTRACT

Most theories of attributions are multidimensional, suggesting that specific causal factors can be classified along such dimensions as internal-external, stable-unstable, or controllable-uncontrollable. To examine the dimensions underlying causal attributions in an educational setting, 345 students who had just received a grade on a major course exam completed a series of questions concerning their attributions and affective reactions. Factor analysis of affective reactions yielded five factors: negative affect, positive affect, calm, sleepiness, and arousal. Further analysis revealed several global attributional scales, i.e., inhibiting causal factors, facilitating personal factors, nonacademic factors, and instructional factors. Examination of the relationship between attributions, affect, and outcome indicated that outcome was closely linked to affect, and that the main effects of three of the four attributional factors (inhibiting, facilitating, instructional) also reached significance on both negative and positive affective reactions. The findings provided some support for the dimensionality assumption in attributions. (JAC)

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ATTRIBUTION-AFFECT LINKAGES AFTER SUCCESS AND FAILURE

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Attribution-Affect Linkages After Success and Failure

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The current research examined several interrelated questions concerning (1) attributions after success and failure, (2) the structure and organization of affective reactions in educational settings, and (3) the mediational linkages between causal attributions and affective responses. Looking first at attributions, this investigation extended previous studies (e.g., Wimer & Kelley, 1982) of the "dimensionality assumption": the premise that attributions to specific causes are based on a relatively small number of more fundamental cognitive dimensions. For example, most theories of attributions--such as Weiner's three factor approach or Kelley's cube model--are multidimensional in that they suggest that specific causal factors (like luck, ability, effort) can be classified along such dimensions as internal-external, stable-unstable, and controllable-uncontrollable. While Wimer and Kelley's (1982) work supports the dimensionality assumption, the current investigation sought to examine the dimensions underlying causal attributions in an educational setting.

Second, affective reactions after success and failure were also examined in order to contrast two opposing models of affective structure: a circumplex bipolar model and a multidimensional unipolar model. According to Russell (1980), affective reactions can be most parsimoneously accounted for in terms of two bipolar dimensions: positive-negative and aroused-relaxed. In contrast, other researchers (e.g., Nowlis, 1965) suggest that affective space is multidimensional and unipolar: for example, emotional reactions may be somewhat positive and somewhat negative at the same time. These two models were contrasted to determine if students' emotional reactions to test performance are best accounted for by the circumplex model or by a unipolar multidimensional approach.

Third, the current research sought to further clarify the link between attributions and affective reactions. Although Weiner and his colleagues (e.g., Weiner, Russell & Lerman, 1978, 1979) suggest that certain affects are associated with certain attributions--for example, ability attributions after success lead to feelings of pride but shame after failure--the results of other investigations (e.g., Forsyth & McMillan, 1981a, 1981b) support two contrasting hypotheses: (1) outcome alone--irrespective of the perceived cause of the outcome--is the primary determinant of affect and (2) specific affective reactions may be linked to attributions, but global affective reactions are not.

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These three constallations of concerns were examined in the present research by assessing attributions and affective reactions with a number of multi-item scales, by defining the dimensionality and underlying structure of these cognitive processes through factor and correlational analysis, and by examining the linkages between attributional dimensions and affective dimensions.

Method

Subjects. Three hundred and forty five males and females who had just received their grade on a a major course exam completed a series of questions concerning their attributions and affective reactions.

Procedure. The items used to measure attributions were drawn from a preliminary instrument described by Forsyth, McMillan, and Pope (1982). The form presents subjects with a list of 70 causal factors that could have influenced their exam performance, and asks them to rate each factor's causal importance on a scale from 1 to 7. Affect was measured by asking individuals to rate themselves on 28 adjectives drawn from Russell's circumplex model (1980). These adjectives were selected to sample the affective space described by the model, and included tense, bored, calm, astonished, and aroused. In addition, four items that Weiner has found to be particularly important in educational settings (ashamed, competent, proud, confused) were also included.

Results

Affective reactions. A principle axes factor analysis with orthogonal varimax rotation of the 32 affect items yielded 5 factors that accounted for 94.02 percent of the total variance. The eigenvalues for these five factors were 10.40, 3.30, 2.69, 1.15, and 0.89, and they accounted for 53.11, 16.84, 13.75, 5.88, and 4.44 percent of the total variance. As is consistent with a multifactor, unipolar model of emotions, the item factor loadings indicated that these five factors referred to negative affect, positive affect, calm, sleepiness, and arousal.

Five affect scales were developed to assess the dimensions obtained through factor analysis. The items included in these five scales are shown in Table 1. The item "bored" did not load on any of these factors.

Attributions. A principle components factor analysis with orthogonal varimax rotation of the 70 attribution items yielded 5 factors that accounted for 77.96 percent of the total variance. The eigenvalues for these five factors were 23.86, 7.89, 3.50, 2.00, and 1.76, and they accounted for 47.69, 15.77, 6.99, 4.00, and 3.51 percent of the total variance. In general, this analysis indicated that the most important dimension included all causes that could have restrained or interferred with performance, such as "not interested in school", "teacher hard to understand," "laziness," and "material on test not well covered." The other four dimensions

referred to facilitating factors (such as motivation, personal study habits), nonacademic factors (such as fate, luck, friendships), instructional aspects of the class (such as the teacher and the text), and personal limitations (such as bad mood and emotional problems). Furthermore, all the items that loaded highly on the last factor--personal problems--also loaded highly on the first factor. Thus, attributions tended to fall into rather global categories that were not completely consistent with previous theoretical analyses.

In order to further explore these global factors, secondary factor analyses were carried out by separately factor analyzing items that loaded on each factor. Based on these analyses, five attributional scales and a number of subscales were developed. The five global scales, which were based on the initial factor analyses, are shown in Table 2, along with the subscales derived from secondary factoring. The Cronbach alpha coefficients for these scales ranged from a low of .69 for the "good teaching methods" scale to a high of .977 for the global "inhibiting factors scale."

Attribution-affect linkages. Relationships between attributions, affect, and outcome were systematically examined through analyses of variance which treated outcome and attributions as classification variables and affective reactions as the dependent variables. To establish outcome levels, subjects were identified as high, moderate, or low scorers on the basis of their responses to the 9-point item "How well did you do on the test?" Similarly, to identify high, moderate, and low attributors on each of the four global attributional scales shown in Table 2, subjects were divided into three attributional categories. Hence, all analyses used a 3 X 3 (outcome X attribution) factorial design.

Concentrating on positive and negative affective reactions, these analyses of variance indicated that outcome was closely linked to affect; high scorers felt more positive and less negative than moderate scorers, who felt more positive and less negative than low scorers. However, the main effects of three of the four attributional factors--inhibiting factors, facilitating personal factors, and instructional factors--also reached significance on both negative and positive affective reactions. As shown in Table 3, individuals experienced more negative (and less positive) affective reactions the more they attributed their outcome to inhibiting factors, but less negative (and more positive) reactions the more they attributed their outcome to facilitating personal factors or instructional factors.

These findings, however, are partially qualified by several significant interactions. First, the two-way intraction of attributions to inhibiting factors and outcome reached significance for negative affective reactions: F (4, 327) = 2.53, $p < .05$. As shown in Figure 1, differences due to outcome were eliminated if subjects were low in their attributions to inhibiting factors. If, however, they were moderate or high in their blame placed on inhibiting factors, then low scorers reported more negative reactions than moderate and high scorers.

In addition, the two-way interaction of attributions to nonacademic factors and outcome reached significance on both negative and positive affective reactions; F (4, 327) = 3.42 and 2.45, $p < .05$. Low scorers who felt that their outcome was due to nonacademic factors--such as bad luck--experienced more negative affective reactions and less positive affective reactions. In addition, high scorers who felt that their outcome was not due to nonacademic factors reported the most positive affective reactions.

Discussion

These findings yield both theoretical and empirical implications. First, they provide some support for the "dimensionality assumption," but they also suggest that the dimensions may not be internal-external and stable-unstable but positive-negative (as Weimer & Kelley, 1982, suggest). Second, these findings yielded more support for a multidimensional model of affect, which allows for the application of opponent-process theories of affect to the educational setting (Solomon, 1980). Third, they suggest that affective reactions may not be as strongly tied to cognitive reactions as previous research suggests, and that the nature of the relationship is not consistent with Weiner's previous laboratory findings.

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Table 1. Affective scales.

Scale Name	Items
Negative affect	frustrated, sad, miserable, depressed, angry, gloomy, distressed, annoyed, confused, afraid, tense, and ashamed.
Positive affect	glad, delighted, pleased, proud, happy, content, competent, and excited
Calm	calm, relaxed, at ease, and tranquil
Sleepy	sleepy, drowsy, and tired
Aroused	astonished, excited, alarmed, aroused

Table 2. Attributional Scales

Scale Name	Items
Inhibiting Causal Factors	
Faulty Teaching Methods	teacher hard to understand, teacher did not explain material, bad teacher, misunderstood teacher, lack of help from teacher, confused by teacher
Inadequate Preparation	studied wrong material, didn't know what to study, studied wrong things, material on test not covered well
Poor Textbook	confused by text, book is unclear, book is boring, text difficult to understand
Poor Test	trick questions on test, unfair test, test questions hard to understand
Low Motivation	not committed to doing well in school, not motivated in this class, not motivated in general, not keeping up, reviewed poorly, didn't study much, typically don't work very hard, not interested in school, laziness
Personal Problems	poor health, bad mood, personal inadequacies, emotional problems, personal problems, depressed
Facilitating Personal Factors	
High Motivation	ambitious, very motivated overall, high desire to achieve, concerned with succeeding, serious, highly motivated
Good Study Habits	studied carefully, good study habits, good student, took good notes
Adequate Preparation	studied right things, knew what to study, book is clear, teacher clarified material, relaxed
Nonacademic Factors	
Luck	bad luck, fate, good luck, fortunate, unfortunate

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Table 2. Attributional Scales (continued)

Scale Name	Items
Nonacademic Factors (continued)	
Friends	like fellow students in class, have friends in this class
Incompetent	dumb, not smart
Instructional Factors	
Good Teaching Methods	teacher easy to understand, teacher clarified material
Classroom Atmosphere	feeling relaxed, calm while taking test, relaxed
Good Textbook	book is clear, text easy to understand, book is interesting, book is interesting, book is clear

Table 3. Attribution-affect linkages

Type of Attribution	Level	Negative Affect	Positive Affect
Inhibiting Factors	Low	1.57	3.55
	Moderate	2.56	2.76
	High	2.70	2.95
Facilitating Personal Factors	Low	2.29	2.86
	Moderate	1.77	3.66
	High	1.91	3.91
Instructional Factors	Low	2.31	2.88
	Moderate	1.88	3.61
	High	1.79	3.92

Higher scores indicate more negative, and more positive, affect, respectively.

FIGURE 1

AFFECT, ATTRIBUTIONS, AND OUTCOME